METHOD AND SYSTEM FOR TIMING RECOVERY AND DELAY SPREAD ESTIMATION IN A COMMUNICATION SYSTEM

5   ABSTRACT OF THE DISCLOSURE

A timing recovery scheme demarcates a complete range of inter-
symbol interference free (ISI-free) sampling positions available in a
cyclically extended symbol. The timing recovery scheme computes an
10   ensemble correlation between the cyclic extension and the data part of
symbols to estimate timing.   The ensemble correlation function retains
delay-spread and timing information by separately maintaining the
correlation value for each sample position within the symbol duration and
combines the correlation values for identical sample positions over an
15   ensemble of symbols. In this manner, the scheme not only provides timing
estimates, but can also provide estimates of the multipath delay-spread in
a channel. The delay-spread estimates provide valuable information about
the nature of the channel. A receiver can use this information, for
example, to adjust the frequency-domain channel interpolation filter
20   bandwidth in order to improve performance for the given channel
condition.